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BOTANICAL MUSEUM LEAFLETS
HARVARD UNIVERSITY

CAMBRIDGE, MASSACHUSETTS, MARCH 3, 1937

VOL. 4, No. 7

NEW ORCHIDS FROM MIDDLE AMERICA

BY

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THE FOLLOWING ORCHIDS, which appear to be undescribed, range from Mexico, through Central America to Panama. They are chiefly taken from the extensive collections of Erik M. Östlund in Mexico, of A. M. Brenes in Costa Rica and of A. A. Hunter and P. H. Allen in Panama. From these collections, it seems evident that the vast areas of Mexico, the Republic of Costa Rica and parts of Panama (notably the Province of Coclé) are still rich in unrecorded species.

The sequence of genera follows, according to our usual practice, that of Pfitzer in Engler and Prantl's "Die natürlichen Pflanzenfamilien."

***Spiranthes affinis* C. Schweinfurth sp. nov.**

Herba terrestris, gracillima, radicibus fusiformibus. Caulis glaber, vaginatus, aphyllus ut videtur. Racemus gracilis, spiralis, dense multiflorus. Flores parvi, patentes. Sepala uninervia. Sepalum dorsale elliptico-ovatum, concavum. Sepala lateralia oblongo-lanceolata. Petala late oblonga vel spathulato-oblonga. Labellum pandurato-subquadratum, basi bicallosum, parte anteriore leviter undulata, apice late truncatum. Columna superne dilatata; anthera comparate magna, suborbicularis, concava.

Plant terrestrial, very slender, closely resembling *S.*

Beckii Lindl., 18.5–29.5 cm. tall, apparently leafless at flowering time. Roots stout, two to three, thick-cylindric to slender-ellipsoid, spreading. Stems slender, glabrous, provided near the apparently stouter base with numerous imbricating scarious tubular mucronate sheaths and on the upper portion with distant smaller tubular sheaths. Raceme slender, densely or subdensely many-flowered with the flowers in a single spiral, 5.7 to about 12 cm. long; rachis glabrous. Floral bracts ovate, shortly caudate, scarious, 1-nerved, little shorter than the flowers at maturity. Ovary obovoid, glabrous, very shortly pedicellate. Perianth horizontally spreading, campanulate, very small, apparently white, translucent. Dorsal sepal elliptic-ovate, concave, about 3 mm. long and 2 mm. wide, obtuse to subacute, 1-nerved. Lateral sepals oblong-lanceolate, about 3 mm. long, 1–1.2 mm. wide, obtuse or subacute with inrolled margins at the apex, 1-nerved, shortly decurrent on the ovary. Petals more or less adherent to the dorsal sepal forming a galea, broadly oblong or spatulate-oblong, little shorter than the dorsal sepal, about 1 mm. wide, slightly incurved and more or less asymmetric, rounded above with more or less irregular margins, 1-nerved. Lip pandurate-subquadrate, slightly exceeding the sepals, broadly truncate and sometimes slightly retuse at the apex, shortly unguiculate, about 3.2 mm. long, 2–3 mm. wide across the basal portion, slightly narrower across the anterior part; disc with a pair of subglobose calli at the base, 5- to 7-nerved, minutely papillose throughout the anterior half which is slightly lobulate and undulate on the margin. Column dilated above; anther conspicuous, suborbicular, concave, broadly rounded or subtruncate above.

Spiranthes affinis appears to have its nearest allies in the North American species, *S. Beckii* Lindl. and *S. gracilis* (Bigel.) Beck. It differs from both, however, in

having 1-nerved sepals and very dissimilar blunt anthers. Among Central American species, it is allied to *S. graminea* Lindl., but is distinguished from that species by its stouter roots, smooth inflorescence and smaller flowers.

Another collection, *Arsène 5476*, consists of uniformly smaller plants 11–22 cm. high and racemes 3–10 cm. long. One of its flowers shows an acute lateral sepal about 3.9 mm. long, petals which are somewhat narrowed and obtuse at the tip and a lip which is trilobulate at the truncate apex, about 3.6 mm. long and definitely shorter than the sepals. In this collection the anterior portion of the lip is more erose and crispate than in the type.

MEXICO, State of Morelos, between Tepetzlan and San Jaunico. Grassy patches between lava. At 1600 meters altitude. March 7, 1933. *Erik M. Östlund 2160* (Collector Benj. Cruz) (TYPE in Herb. Ames No. 41425): State of Michoacán, vicinity of Morelia, Jesús del Monte. March 28, 1910. *Bro. G. Arsène 5476*. (U.S. Nat. Herb. No. 1032524).

***Spiranthes albovaginata* C. Schweinfurth sp. nov.**

Herba terrestris. Radices fasciculatae, incrassatae. Caulis vaginis albo-scariosis omnino tectus. Folia marcescentia, prope plantae basim. Racemus dense multiflorus. Flores extus glandulosi; perianthium campanulatum, patens. Sepalum dorsale ovato-oblongum, concavum. Sepala lateralia oblongo-lanceolata, acuta. Petala sepalo dorsali valde adhaerentia, oblongo-linearia. Labellum oblongo-ovatum, prope apicem utrinque constrictum igitur panduratum, apice retuso-apiculatum. Columna cum acumine conspicuo.

Plant terrestrial, 55–59 cm. high. Roots fasciculate, numerous, slender-fusiform. Stem glabrous below, densely glandular near the raceme, entirely invested by scarious white green-veined sheaths which are close and bear marcescent leaves on the lower portion and which are

shorter with spreading acuminate apices above. The withered remnants of leaves indicate oblong-lanceolate blades. Raceme densely many-flowered, 8–9 cm. long, 1–(rarely) 2 cm. in diameter. Floral bracts white, translucent, thinly scarious, ovate, long-acuminate, up to 1.7 cm. long, concave below, with three green veins. Ovary densely glandular, ellipsoid in anthesis. Flowers small, horizontally spreading; perianth campanulate; sepals densely glandular on the outer surface. Dorsal sepal ovate-oblong, concave, about 6.5–6.9 mm. long and 3 mm. wide, acute, 3-nerved. Lateral sepals linear-lanceolate or oblong-lanceolate, 6.2–7.1 mm. long, about 2 mm. wide at the base, acute, 1-nerved with a less distinct supplementary nerve, asymmetric at base. Petals strongly adnate to the dorsal sepal forming a galea, oblong-linear, little shorter than the dorsal sepal, 6–7 mm. long, about 1.1 mm. wide, lightly incurved and oblique, rounded to subacute at the apex, 1-nerved. Lip oblong-ovate, pandurate, constricted near the apex, retuse and apiculate at the tip, rounded at the sessile base, about 7.2 mm. long, 3.5–4 mm. wide below the middle, anterior portion somewhat narrower and transversely oval. Column slightly dilated above, minutely papillose on the anterior surface, terminating in a triangular-lanceolate rostellar point. Anther conspicuous, broadly ovate-cordate, concave, very shortly stipitate.

Spiranthes albovaginata, while vegetatively similar to *S. Arsèniana* Kränzl., has apparently no near allies.

MEXICO, near Chalma, in loamy earth under oaks. At about 2500 meters altitude. April 20, 1933. Erik M. Östlund 2267 (Collector Juan G.) (TYPE in Herb. Ames No. 41427).

***Spiranthes densiflora* C. Schweinfurth sp. nov.**

Herba terrestris, elata. Caulis vaginis scariosis laxis omnino obtectus. Folia marcescentia, distantia. Racemus

densissimus. Bracteae racemi scariosae, ovatae, conspicue nervosae. Flores extus valde glandulosi. Sepalum dorsale ovato-oblongum, basi valde concavum. Sepala lateralia oblongo-lanceolata. Petala elliptico-linearia, sepalo dorsali valde adhaerentia. Labellum ovatum, apice rotundatum, basi late rotundata lateribus prope medium inflexis. Anthera magna, orbiculari-cordata.

Plant terrestrial, tall, sigmoid-flexed in our specimen. Roots fasciculate, fleshy-thickened, about five in number, slender-fusiform, finely tomentose. Stem (including the raceme) about 105 cm. in length, entirely concealed below by long very loose tubular scarios leaf-sheaths and above by short loose scarios imbricating sheaths. Leaves distant, confined to the lower and middle portions of the plant, merely withered remains at flowering time, imperfect but apparently elliptic-lanceolate in our specimen. Raceme very dense, arcuate, 11.5 cm. long but very immature above, about 2-3 cm. in diameter. Floral bracts scarios, ovate, sharply acuminate, with five prominent brownish nerves. Ovary and outer surface of sepals densely glandular-pubescent. Flowers small for the plant. Dorsal sepal strongly concave at the base, ovate-oblong, about 11 mm. long, 4 mm. wide below the middle, acuminate, 1-nerved or indistinctly 3-nerved. Lateral sepals connate with the dorsal sepal at the base, oblong-lanceolate, acuminate, acute, about 10.2 mm. long, 2.7 mm. wide below the middle, slightly asymmetric at base and apex, indistinctly 3-nerved. Petals strongly adnate to the dorsal sepal, elliptic-linear, little shorter than the dorsal sepal, lightly incurved, acute, 1-nerved, about 1.5 mm. wide. Lip simple, ovate, subsessile, strongly involute on each side just above the middle, slightly undulate on the anterior margins, about 9 mm. long, 6.6 mm. wide near the base, rounded at the apex with an inconspicuous apicule, broadly rounded and obscurely bicallose at the base;

disc minutely papillose on the inner surface near the base and the apex. Column deeply 3-toothed above, the central tooth a bristle-like continuation of the rostellum. Anther relatively conspicuous, shortly stipitate, orbicular-cordate.

Another much smaller plant (which is apparently incomplete) is referable to this species. It differs from the type, however, in having on the lower part of the stem an ovate-elliptical leaf which is about 6 cm. long and 2.3 cm. wide and in having somewhat smaller flowers.

Spiranthes densiflora appears to be rather closely allied to *S. michuacana* (La Llave & Lex.) Hemsl., but differs in its much greater height, smooth floral bracts and much smaller flowers with dissimilar petals. It varies from *S. Arsèniana* Kränzl. in having very different petals and lip.

MEXICO, State of Morelos, Tepeyte. At 2300 meters altitude. Flowered at Cuernavaca, October 10, 1932. *Erik M. Östlund 1513* (Collector Carbonero) (TYPE in Herb. Ames No. 41426): State of San Luis Potosi, Álvarez. December 1924. *C.R. Orcutt 1946* (U.S. Nat. Herb. No. 1209110).

***Spiranthes obtecta* C. Schweinfurth sp. nov.**

Herba terrestris, foliis marcescentibus. Caulis vaginis albo-scariosis tubularibus lineatis omnino velatus. Racemus densiflorus; flores parvi, spirales, bracteis albo-scariosis omnino obtecti. Sepalum dorsale oblongo-lanceolatum, concavum, cum petalis adnatis galeam formans. Sepala lateralia lineari-lanceolata, acuminata. Petala elliptico-linearibus, leviter sigmoidea. Labellum panduratum, prope apicem valde recurvatum, parte inferiore cuneato-rhombica, parte superiore ovata cum marginibus crenulatis involutis. Gynostemium generis.

Plant terrestrial, 25–35 cm. tall. Roots very stout, spreading, lanuginose. Leaves apparently absent at flow-

ering time, represented by remnants of very narrowly elliptic blades whose long petioles are imbricating at base. Stem flexuous or erect, terete, entirely concealed by long tubular white-scarious imbricating sheaths which are 5–6 cm. long and are marked with brownish purple longitudinal nerves. Inflorescence a dense terminal raceme, about 7–8.6 cm. long. Flowers small, spirally arranged, about thirteen to twenty, blossoming successively over a long period of time, much surpassed and mostly concealed by the scarious bracts which are ovate-lanceolate, long-acuminate, concave at base and marked with about nine prominent longitudinal nerves. Dorsal sepal oblong-lanceolate, concave, about 9.5–12 mm. long and 3.2 mm. wide, acuminate, 3-nerved, recurved at apex. Lateral sepals linear-lanceolate, 9–11 mm. long, about 1.8–2 mm. wide, acuminate, 3-nerved, recurving and “twisting to form loop which frequently holds bract of preceding flower tightly against stem.” Petals strongly adnate to the dorsal sepal forming a galea, distinctly shorter than the dorsal sepal, elliptic-linear, slightly sigmoid, 8–9 mm. long and 2.3 mm. wide in the middle, subacute to obtuse, 3-nerved. Lip recurved at the apex and upcurved at the base in natural position, pandurate with a distinct rounded constriction just above the middle, 9.5–12 mm. long when expanded, about 5–6 mm. wide just below the middle and slightly narrower above; the lower portion concave in natural position, flabellate-rhombic with rounded outer angles, cuneate toward the base with more or less thickened margins; anterior portion ovate, with inrolled crenulate margins, subacute to broadly rounded at apex when expanded; disc minutely papillose. Column small, oblique at base, 5.5 mm. or less long, dilated above, minutely papillose in front, with a triangular rostellum which is abruptly contracted to a linear-ligulate point. Anther cucullate-cordate.

Spiranthes obtecta is allied to *S. eriophora* Robins. & Greenm. and to *S. velata* Robins. & Fern. From the former it differs in its densely flowered raceme, smooth rachis, much smaller flowers and narrower petals. From the latter it is distinct by reason of its quite dissimilar and less conspicuous lip.

GUATEMALA, road to Mataquescuintla about twenty miles from Guatemala City. Common. Terrestrial in open clearings. At about 8000 feet altitude, in shallow layer of topsoil (chiefly semi-decayed pine-needles). Sepals pale green; petals white; lip white with fine green mid-nerve. April 21, 1934. *Margaret Ward Lewis 101* (TYPE in Herb. Ames No. 40375).

***Spiranthes sparsiflora* C. Schweinfurth sp. nov.**

Herba terrestris, hysteroantha. Radices fasciculatae, crassae. Folia oblanceolata vel spathulato-oblanceolata. Pedunculus infra racemum vaginis scariosis numerosis ornatus. Racemus laxiflorus. Flores parvi. Sepalum dorsale elliptico-lanceolatum, apice cucullato-rotundatum. Sepala lateralia lineari-lanceolata, obtusa. Petala cum sepalo dorsali galeam formantia, anguste elliptico-lanceolata, falcata. Labellum in circuitu ovato-oblongum; parte inferiore subquadrato-pandurata; parte anteriore multo minore, ligulato-apiculata. Columna generis.

Plant terrestrial, about 20–22 cm. high. Roots very stout, fasciculate, thick-cylindric or fusiform, lanuginose. Leaves not present at flowering time, erect, oblanceolate or oblanceolate-spatulate; blades about 7–14 cm. long, 2.3–2.95 cm. wide, acute or acuminate, membranaceous, 7-nerved with several supplementary nerves, gradually passing into the petioles; petioles slender, about 8 cm. long or less. Scape about 20 cm. long, obviously immature in our specimen. Peduncle up to the inflorescence adorned with numerous scariosus infundibuliform acuminate sheaths which are imbricating below and looser a-

bove, glabrous below, puberulent above. Raceme loosely many-flowered, about 9 cm. long; rachis puberulent. Flowers horizontally spreading. Floral bracts lanceolate, acuminate, scarious, 3-nerved. Perianth membranaceous except the lip. Dorsal sepal elliptic-lanceolate, concave, about 5.8 mm. long and 2 mm. wide, cucullate-rounded at the apex, 3-nerved. Lateral sepals linear-lanceolate, obtuse, about 6 mm. long and 1.2 mm. wide, 3-nerved, longitudinally concave. Petals adherent to the dorsal sepal forming a galea, narrowly elliptic-lanceolate, falcate, obtuse, about 6 mm. long and 1.6 mm. wide in the middle, 3-nerved through the lower half and 1-nerved throughout. Lip ovate-oblong in outline, shortly unguiculate, about 6 mm. long; lamina pandurate-subquadrate, with the apical third rather abruptly narrowed into an oblong-ligulate lobule; lower portion oblong-pandurate, about 4.3 mm. long, about 2.5 mm. wide near the base and apex, cordate at the base where are situated a pair of incurved indusium-like calli, thickened through the central portion; apical portion relatively small, 1.6 mm. long, about 1 mm. wide or more, rounded at the tip. Column about 5 mm. long, slender, pubescent on the anterior surface, extended into a short foot; anther elongate, cordate-oblong.

Spiranthes sparsiflora has a lip that suggests *S. elata* (Sw.) L.C. Rich. in its lower portion and *S. cranichoides* (Griseb.) Cogn. in its anterior portion. The leaves, however, are different from those of both species. The lip somewhat resembles that of *S. costaricensis* Reichb.f. which has very different basal calli.

MEXICO, State of Morelos, Chapultepec, "4 km. east of Cuernavaca in leafmould on rocks near brook. Fls. dingy grey-white. L-lobes yellow." At 1500 meters altitude. Leaves collected October 17, 1932; flowers (in pot) March 17, 1933. Erik M. Östlund 1554 (Collector O. Nagel) (TYPE in Herb. Ames No. 42369).

Liparis cordiformis C. Schweinfurth sp. nov.

Herba terrestris, rhizomate pergracili. Caulis basi in-crassatus. Folium singulum, circiter in plantae medio, suborbiculari-cordatum, acutum vel obtusum. Pedunculus filiformis. Racemus brevis, laxe pauciflorus. Flores purpurei ut videtur. Sepalum dorsale ovato-lanceolatum, trinervium. Sepala lateralia ovato-oblonga, uninervia. Petala anguste linearia, basi paulo dilatata. Labellum unguiculatum; unguis crassissimus, marginibus erectis undulatisque; lamina anguste triangulari-hastata, basi retrorse auriculata, apice conspicue mucronata; discus valde unicarinatus. Columna crassa, basi dilatata.

Plant small, up to 14 cm. high, erect or somewhat arcuate, rising from a rhizome which is very slender, long, rarely forking and terminating in an ellipsoid swelling. Stems slender, closely enveloped by the sheathing petiole of the leaf, with the swollen or lageniform base concealed by a loose scarious sheath, 2.5–5.5 cm. long. Leaf solitary, suborbicular-cordate, at about the middle of the plant, spreading from a deeply cordate-clasping base, about 2.1–4.1 cm. long from the bottom of the basal lobules to the apex, 2.1–4.1 cm. wide, acute or obtuse, membranaceous in the dried specimen. Peduncle up to the inflorescence about 1.6–5.5 cm. long, filiform, naked, glabrous. Raceme short, loosely 3- to 8-flowered; rachis up to 1.8 cm. long. Floral bracts spreading, triangular, acuminate, concave at base, membranaceous. Pedicels conspicuously surpassing the bracts, up to 10.5 mm. long in fruit. Flowers apparently wine-colored; perianth reflexed, transparent when moistened. Sepals with revolute sides, minutely cellular-papillose on the inner surface. Dorsal sepal ovate-lanceolate, about 5 mm. long and 1.9 mm. wide below the middle, narrowed to an obtuse tip, 3-nerved. Lateral sepals ovate-oblong, narrowed to an obtuse tip, 5 mm. long, 1.9 mm. wide, slightly asym-

metric, 1-nerved. Petals narrowly linear, gradually dilated at the oblique base, about 4.9 mm. long, obliquely acute, 1-nerved. Lip about 5.2 mm. long including the claw; claw conspicuous, subquadrate, very fleshy with erect undulate sides; lamina narrowly triangular-hastate, with retrorse ovate-triangular obtuse auricles, gradually narrowed above and abruptly constricted near the apex to form a prominent recurved mucro; disc with a stout fleshy keel extending nearly from the base of the lamina to the subapical constriction, 5-nerved. Column short, stout, about 1.9 mm. long, strongly dilated at base and less so above, with a pair of semiorbicular porrect wings at the apex.

Liparis cordiformis is vegetatively similar to *L. neuroglossa* Reichb.f., but has a very different lip. Apparently the closest ally of this plant is *L. fantastica* A. & S., but the latter species has much larger flowers and a dissimilar lip.

MEXICO, State of Michoacán, stony lava-fields near Pátzcuaro. In leaf-mould in shady places of mixed forest on rocky slopes. At 2150 meters altitude. October 5, 1933. *Erik M. Östlund 3135* (Collector O. Nagel) (TYPE in Herb. Ames No. 41386).

Masdevallia tenuissima *C. Schweinfurth sp. nov.*

Herba nana. Radices fibrosae, glabrae. Caules perbreves, vaginis tubularibus obtecti. Folium singulum, lineari-ellipticum vel lineari-oblancheolatum, erectum. Scapus singulus, filiformis, folium plus minusve superans, saepissime uni- vel biflorus. Sepala connata, in caudas carnosas abrupte contracta. Sepalum dorsale ovato-suborbiculare, cucullatum. Sepala lateralia lanceolata. Petala minuta, lanceolata, apice oblique tridentata. Labellum petalis aequilongum, oblongo-lanceolatum, dimidio basali bicarinatum.

Plant dwarf, caespitose, up to 3 cm. high. Roots fi-

brous, glabrous, slender but stout in relation to the plant. Stems minute, up to 5 mm. tall, concealed by one to three scarious tubular imbricating sheaths. Leaf solitary, linear-elliptic to oblanceolate-linear, subacute to rounded and minutely tridenticulate at the apex, cuneate-narrowed at the base, up to 1.7 cm. long and 2.4 mm. wide, subcoriaceous, with the mid-nerve more or less conspicuous. Scape filiform, more or less surpassing the leaf, with a single tubular closely clasping sheath near or below the middle, arising near the base of the stem, 1- to very rarely 4-flowered. Peduncle about 2.8 cm. or less tall. Flower small, membranaceous except the sepaline tails, somewhat bilabiate. Sepals connate at base. Dorsal sepal about 5.8 mm. long, connate with the lateral sepals for about 1.1 mm., basal part of the free portion about 2 mm. long, suborbicular-ovate, 3-nerved, abruptly contracted into a fleshy linear-subclavate cauda which is about 3.7 mm. long. Lateral sepals about 7.2 mm. long, connate for 2.8 mm.; each free part ovate-lanceolate, 3-nerved, abruptly contracted into a fleshy linear cauda which is about 2.8 mm. long. Petals much smaller, lanceolate, acute, very unequally tridentate at the apex, 2 mm. long, about 0.9 mm. wide near the middle, 1-nerved. Lip minutely unguiculate, oblong-lanceolate, 2 mm. long, about 0.75 mm. wide, rounded at the apex, 3-nerved, with two intramarginal fleshy keels above the lateral nerves of the basal half, the keels extended into minute auricles. Column short, stout, terminating in a dentate wing.

Masdevallia tenuissima is allied to *M. exigua* A. & S., and the very similar *M. pygmaea* Kränzl., but differs from both in having elongate scapes, not echinate ovary, and dissimilar petals and lip.

PANAMA, Province of Coelé, mountains beyond La Pintada. At 400-600 meters altitude. February 17, 1935. *A. A. Hunter & P. H.*

Allen 587 (TYPE in Herb. Ames No. 42015).

Pleurothallis caudatisepala *C. Schweinfurth* sp.
nov.

Herba perparva, epiphytica. Caules dense caespitosi, brevissimi, vaginis tubularibus scariosis omnino velati. Folium spathulatum vel spathulato-oblancheolatum, inferne in petiolum sensim angustatum. Flores plures. Sepala similia, lanceolata, perlonge caudata, uninervia. Petala dimidio breviora, lanceolato-acuminata, leviter falcata. Labellum minutum, elliptico-ovatum, acutum, sessile. Columna brevissima, concavo-semiorbicularis.

Plant very small, epiphytic, densely caespitose, reaching 3.5 cm. in height. Roots fibrous, flexuous, relatively stout. Stems very short, 1-jointed, up to about 5 mm. long, enclosed by two or three scarious tubular imbricating sheaths. Leaf solitary, erect, spatulate or spatulate-oblancheolate, gradually narrowed to a petiole, up to 23 mm. long including the petiole, up to 4.5 mm. wide, obtuse with a minutely bilobed and apiculate apex. Inflorescence exceeding the leaves, filiform, provided at base and below the middle with a scarious tubular sheath and at the top with two to six flowers in a loose or subumbellate raceme. Floral bracts infundibuliform, acuminate, scarious, much shorter than the pedicels. Flower (except the lip) membranaceous. Sepals lanceolate, very long-caudate, 1-nerved, apparently conduplicate. Dorsal sepal about 10.1 mm. long and 1.4 mm. wide near the base. Lateral sepals very similar, about 10.5 mm. long and 2 mm. wide near the base. Petals similar to the sepals but much shorter, oblong-lanceolate, very long-acuminate, 1-nerved, slightly falcate, about 5.2 mm. long and 1 mm. wide. Lip much smaller, subfleshy, elliptic-ovate, sharply acute, 1.5 mm. long, about 0.9 mm. wide, sessile. Column very short, concave, flabellate or semiorbicular.

Pleurothallis caudatisepala is allied to *P. propinqua* Ames, but differs in having elongate-caudate sepals and a relatively small lip.

COSTA RICA, "Haies. Entre La Balsa et Cataratas de San Ramón. Alt. 800 m. 12-x-1925. Fleurs. . . jaunes-pâles brunâtre orangés, brunâtres en vieillissant, labelle pourpre." *A. M. Brenes* (259) 1445 (TYPE in Herb. Ames No. 43773).

***Pleurothallis concaviflora* C. Schweinfurth sp. nov.**

Herba parva, caespitosa. Radices numerosae, fibrosae. Caules filiformes. Folium ellipticum vel oblongo-ellipticum, sessile, apice obtuso tridenticulatum, valde coriaceum. Pedunculi fasciculati, uniflori, cum flore usque ad folii medium tendentes. Flos bilabiatus, carnosus. Sepalum dorsale ovato-ellipticum. Sepala lateralia in laminam suborbicularem connata. Petala multo minora, lineari-oblonga, apice crasso incurvata. Labellum profunde conduplicato-concavum, triangulari-ovatum, basi cum auriculis retrorsis et in medio callo hippocrepiformi ornatum.

Plant small, caespitose, up to 9 cm. tall, probably epiphytic. Roots fibrous, flexuous, numerous, glabrous. Stems filiform, scarcely stouter than the roots, about 3–7 cm. long, provided near the base with a close tubular evanescent sheath, slightly enlarged toward the junction with the leaf. Leaf elliptic or oblong-elliptic, sessile, about 3–3.8 cm. long and 7–11 mm. wide, minutely tridenticulate at the obtuse apex, marginate, thickly coriaceous in the dried specimen with the mid-nerve more or less sulcate above and carinate beneath. Peduncles numerous, fascicled, 1-flowered, short. Flowers small, rather fleshy. Sepals apparently closely pubescent on the inner surface. Dorsal sepal concave, ovate-elliptic when expanded, about 4–4.7 mm. long and 2.4–3.2 mm. wide, acute, 3-

nerved with the mid-nerve dorsally carinate. Lateral sepals connate into a deeply concave lamina which is suborbicular when expanded; lamina 4–5 mm. long, 4–4.4 mm. wide, acute, 4-nerved, with the inner nerves dorsally somewhat carinate below. Petals much smaller, oblong-linear, sometimes with a slightly dilated base, acute and incurved at the thickened apex, about 2.1–2.5 mm. long, up to 1 mm. wide, 1-nerved, with a prominent dorsal keel. Lip simple, deeply conduplicate-concave, triangular-ovate, with a pair of retrorse triangular-lanceolate obtuse auricles, about 2 mm. long in natural position, acute with an incurved mucronate apex; disc 3-nerved, slightly narrowed on each side below the middle, provided with a hippocrepiform callus at the base. Column very short and stout.

Pleurothallis concaviflora is apparently allied to *P. excavata* Schltr., but has longer stems, shorter leaves, almost twice smaller flowers and dissimilar petals. It is vegetatively similar to *P. Sanchoi* Ames, but has very different petals and a dissimilar lip.

COSTA RICA, "Colinas de San Pedro de San Ramón. 14-XI-1927."
A. M. Brenes (134) 1668 (TYPE in Herb. Ames No. 43774).

***Pleurothallis rotundata* C. Schweinfurth sp. nov.**

Herba parvula, caespitosa. Caules monophylli, vaginis tubularibus hispidis cum ostiis ovatis omnino tecti. Folium erectum, late ovale vel suborbiculare, apice basique rotundatum. Racemi axillares, numerosi, perbreves, biflori. Sepala anguste lanceolata vel triangulari-lanceolata, acuminata, lateralia per tertiam basalarem connata. Petala perparva, oblonga, marginibus superioribus longe fimbriatis. Labellum lanceolatum, acuminatum, trinerivium, marginibus inferioribus ciliatis vel fimbriatis.

Plant small, caespitose, up to 13 cm. high to the apex of the erect leaf. Stems 2.2–10.1 cm. tall, entirely con-

cealed by four to eleven tubular sheaths which are densely hispid on the nerves and terminate in ovate marginate hispid mouths. These mouths are spreading and successively larger upward. Leaf solitary, round-ovate, round-oval or suborbicular, abruptly short-petioled; lamina 2.5–3.7 cm. long, 2–3.5 cm. wide, broadly obtuse to slightly retuse at the broadly rounded apex, subtruncate to broadly rounded at the base, subcoriaceous, the mid-nerve and commonly two other nerves more or less prominent on both surfaces. Racemes numerous, abbreviated, about 2-flowered, the flowers reaching the middle of the erect leaf. Flowers membranaceous. Dorsal sepal narrowly triangular-lanceolate, about 5.8 mm. long, 1.8 mm. wide near the base, acuminate, 3-nerved. Lateral sepals about 5.1 mm. long, connate for about the basal third; free portion narrowly lanceolate, acuminate with recurved apex, 3-nerved. Petals much smaller, oblong, somewhat broadened at the base on the anterior margin, about 2.1 mm. long and 1 mm. wide at the base, long-fimbriate above, 1-nerved. Lip simple, lanceolate, acuminate, 3 mm. long, about 1 mm. wide near the middle, 3-nerved, minutely auricled at base; the margins of the lower half irregular and fimbriate. Column very short with a fimbriate clinandrium.

Pleurothallis rotundata appears to be unique among the Central American species of the Lepanthiform section of the genus in having very broad obtuse leaves and an acuminate lip. It differs from *P. trachythea* Lehm. & Kränzl. in lacking the distinct terminal awn to the petals and in the much shorter lip.

The flower examined was on the summit of a swollen ovary and in an advanced stage of anthesis. The specific name is in reference to the form of the leaf.

PANAMA, Province of Coclé, mountains beyond La Pintada. At

400-600 meters altitude. February 16, 17, 1935. *A.A. Hunter & P.H. Allen 561* (TYPE in Herb. Ames No. 42016) .

***Scaphyglottis Wercklei Schltr.* var. **major** C. Schweinfurth var. nov.**

A specie caulibus longioribus et foliis maxima pro parte multo majoribus et labello paulo latiori differt.

Stems narrowly cylindrical, much branched, up to 17.1 cm. long. Leaves linear-lanceolate, rigidly spreading, up to 8.5 cm. long and 8.5 mm. wide, narrowed to an abruptly obtuse tip which is minutely bilobed and apiculate. Flowers white. Dorsal sepal oblong-elliptic, about 5.1 mm. long and 2 mm. wide, acute, 3-nerved. Lateral sepals broadly oblong, very asymmetric, about 5 mm. long and 2 mm. wide, forming a distinct mentum, acute, 3- to 4-nerved. Petals linear, more or less narrowed toward the base, 4.6-5 mm. long, up to 1.1 mm. wide, obtuse, 1- or 2-nerved, or 3-nerved above the middle. Lip subparallel to the column and recurved in natural position, cuneate-flabellate in outline, gradually dilated from an unguiculate thickened base, very obscurely trilobulate at the broad apex with the broad mid-lobe very shallowly retuse, about 4 mm. wide near the apex. Column without angulate wings, about 4 mm. long.

The variety *major* differs from typical *Scaphyglottis Wercklei* in being a stouter plant with the lower stem-members much longer, with often much larger leaves and with a broader lip. Vegetatively it has an aspect quite different from that of *S. Wercklei*, but the flowers show its alliance to that species.

BRITISH HONDURAS, Belize District, Gracie Rock, Sibun River. Epiphyte in secondary forest. January 30, 1936. *Percy H. Gentle 1781* (TYPE in Herb. Univ. Michigan. DUPLICATE TYPE in Herb. Ames No. 43848).

Epidendrum concavilabium *C. Schweinfurth sp. nov.*

Herba epiphytica, robusta, humilis. Caules foliorum vaginis imbricantibus omnino obtecti. Folia pauca, disticha, oblongo-elliptica, apice bilobata. Inflorescentia brevis, pauciflora. Bracteae conspicuae, equitantes, patentes, dorso valde carinatae. Flores carnosi. Sepalum dorsale elliptico-ovatum, acutum. Sepala lateralia obliquissime semiorbiculari-ovata, acuta. Petala lanceolato-elliptica, obtusa. Labellum columnae apici adnatum, simplex, valde concavum, basi cordatum, apice bilobatum. Columna generis.

Plant robust, caespitose, epiphytic. Roots fibrous, numerous. Stems entirely concealed by imbricating complanate sheaths which are mostly leaf-bearing, up to 10.8 cm. long. Leaves up to five, oblong-elliptic, distichous and widely spreading, successively larger upward, up to 10 cm. long and 5.2 cm. wide, abruptly much smaller below, bilobed at the apex with rounded lobules, apparently fleshy in the living specimen. Peduncle up to the raceme very short, about 3.5 cm. long, mostly concealed by one equitant carinate spathe. Raceme short and stout, 5- to 6-flowered, about 7 cm. long and 3.5 cm. wide near the base. Floral bracts equitant, ovate when spread, deeply carinate with the keel decurrent on the rachis and peduncle, up to 2.5 cm. long. Flower, especially the sepals and lip, rather fleshy. Sepals and petals horizontally spreading or recurved. Dorsal sepal elliptic-ovate, about 12.3 mm. long and 8 mm. wide, abruptly acute with a retrorse mucro on each side of which are two minute subtriangular lamellae, 7-nerved. Lateral sepals semiorbicular-ovate, very asymmetric with the posterior margin nearly straight and the anterior margin strongly convex, about 13 mm. long and 9.2 mm. wide near the middle, acute, mucronate with a short dorsal dentate keel, about

8-nerved. Petals lanceolate-elliptic, obtuse or rounded at the apex, about 12 mm. long and 6 mm. wide in the middle, 3-nerved with the lateral nerves branching. Lip adnate to the apex of the column, simple, strongly concave, cordate at the base, bilobed at the apex, about 13.6 mm. long from the tip of a basal auricle to the tip of an apical lobule and 15 mm. wide when expanded, the three central nerves slightly and shortly carinate-thickened near the base and the central one conspicuously thickened above, the margins irregularly crenulate. Column short and very stout, 8 mm. long measured dorsally.

Epidendrum concavilabium suggests *E. coriifolium* Lindl. and *E. nitens* Reichb.f., but differs from both species in having a dissimilar lip and broader petals.

COSTA RICA, Colinas de San Pedro de San Ramón. "14-XI-1927."
[A. M. Brenes] (119) 1660 (TYPE in Herb. Ames No. 43877).

Maxillaria appendiculoides C. Schweinfurth sp.
nov.

Herba epiphytica. Caules elongati, sine pseudobulbis, foliorum vaginis imbricantibus omnino obtecti. Folia disticha, numerosa, late patentia. Inflorescentiae breves, axillares, uniflorae. Flos parvus, membranaceus. Sepalum dorsale ovato-lanceolatum, longe acuminatum, valde concavum. Sepala lateralia lanceolata vel ovato-lanceolata, valde obliqua, complicato-acuminata. Petala elliptico-linearia, falcata, acuta. Labellum in circuitu rhomboideum, obscure trilobatum, antice truncatum, basi cuneatum; discus parte inferiore callo crasso oblongo ornatus. Columna arcuata, in pedem producta.

Plant epiphytic. Stem elongate, flexuous or arcuate, sparingly branched, without pseudobulbs, entirely concealed by distichous imbricating leaf-sheaths, about 5 mm. wide or less across the sheathed stems, at rare intervals producing a few fibrous roots. Leaves articulated,

those present confined to the upper portion of the stems, numerous, distichous, horizontally spreading, ovate-oblong or elliptic-oblong, about 2.4 cm. long or less, up to 8 mm. wide (the larger and the smaller blades interspersed), rounded at the apex with slightly unequal lobules separated by an apicule, deeply clasping at the base, with the mid-nerve conspicuously sulcate above and carinate beneath. Inflorescences scattered on the upper part of the plant, short, axillary, solitary, 1-flowered, about equaling the leaves. Peduncle adorned with one or two scarious erect acute sheaths. Flower small, membranaceous. Dorsal sepal strongly concave, when expanded ovate-lanceolate, long-acuminate, about 7.9 mm. long and 3.2 mm. wide below, 3- or less distinctly 5-nerved. Lateral sepals obliquely lanceolate or ovate-lanceolate, about 7 mm. long and 2.8-3 mm. wide, long-acuminate with infolded margins, 3- or indistinctly 5-nerved. Petals falcately elliptic-linear, about 6.5 mm. long and 1.2 mm. wide in the middle, complicate-acute, 3-nerved through the lower portion and 1-nerved throughout. Lip rhomboid in outline, subsimple or indistinctly 3-lobed above the middle, 6 mm. long, about 3.7-4 mm. wide across the middle, cuneate toward the base, with the anterior portion subquadrate or subquadrate-ovate, broadly truncate at the apex in the center of which is a dorsal thickening; disc with a fleshy oblong callus extending from near the base to the middle. Column short, abruptly arcuate and somewhat dilated above, 3.2-3.9 mm. long, extended into a foot which is about 2.8 mm. long. Anther conic-hemispherical; pollinia four.

Another collection, (*Brenes 182*) 1378, differs from the type in having larger leaves which extend to about 3.2 cm. in length and 1.1 cm. in width, also in having slightly smaller flowers. It shows a pollen-mass consisting of two pairs of complanate-obovoid pollinia attached

to a very short stipe.

This species has much the habit of *Camaridium dendrobioides* Schltr., but has very dissimilar floral segments. It is apparently allied to *Maxillaria linearifolia* A. & S., but differs in having short blunt leaves and much smaller flowers.

COSTA RICA, "Bois. Collines de San Pedro de San Ramon. Alt. 1100 m. 20-IX-1925." *A. M. Brenes* (239) 1427. (TYPE in Herb. Ames No. 43846); "8-VIII-1925. Fleurs. . . en couleur jaune verdâtre pâle. . . le calle de labelle. . . pourpre violacé foncé. Cultivé chez moi." *A. M. Brenes* (182) 1378.

***Ornithidium sigmoideum* C. Schweinfurth sp. nov.**

Herba robusta, sparsissime ramosa. Caules vaginis conduplicatis imbricantibus lanceolatis omnino celati, pseudobulbos perdistantes ferentes. Pseudobulbi complanato-ellipsoidei, monophylli. Folia oblongo-elliptica, cum petiolo distincto. Flores mediocres. Sepalum dorsale oblongo-lanceolatum, concavum. Sepala lateralia oblongo-lanceolata. Petala oblonga. Labellum inferne profunde saccatum, valde sigmoideum, superne trilobatum cum lobis lateralibus semicuneatis erectis et lobo terminali parvo ovato conduplicato. Columna gracilis.

Plant robust, about 45 cm. tall. Roots fibrous, flexuous, numerous. Stem stout, very sparingly branched, about 5 mm. in diameter in the dried specimen, entirely invested by distichous imbricating shining sheaths which are conduplicate, triangular-lanceolate, deeply carinate, mucronate and slightly incurved in natural position, but are evanescent on the lower portion of the stem, bearing pseudobulbs at intervals of 25 cm. more or less. Pseudobulbs complanate-ellipsoid, 2.3 cm. long or more, monophyllous, shining, surrounded and surpassed by a pair of distichous leaf-bearing sheaths. Leaves oblong-elliptic, petioled; blade up to 15 cm. long and nearly 4 cm. wide, acute or acuminate, chartaceous, with the mid-nerve

somewhat sulcate above and carinate beneath; petiole distinct, conduplicate, long or very short, up to 4 cm. in length. Inflorescences short, 1-flowered, solitary, in the axils of the imbricated sheaths of the stem. Peduncles concealed by several conduplicate lanceolate or ovate-lanceolate imbricated acuminate bracts. Flowers medium-sized. Dorsal sepal elliptic-lanceolate or oblong-lanceolate, strongly concave, about 14.9–16 mm. long and 5–6 mm. wide, complicate-acute, 7- to 9-nerved, dorsally carinate toward the apex. Lateral sepals oblong-lanceolate, acute or subacute, somewhat asymmetric, about 13.5–15 mm. long, 4.5–5 mm. wide near the base, 6- to 7-nerved. Petals oblong, acute, about 12–14 mm. long, 3 mm. wide, acute, 5-nerved, with a slight concavity near the apex on the posterior margin. Lip rigidly attached to the column-foot, sigmoid-curved below, about 11.5–12.8 mm. long in natural position, deeply 3-lobed about one third the length from the apex, with the basal portion (about 5 mm. long) deeply saccate, the sac porrect and almost contiguous to the abruptly reflexed central portion; lateral lobes erect, spreading, semicuneate, with a straight anterior margin, free portion about 2.5 mm. wide; mid-lobe small, strongly conduplicate, concave at the base, broadly ovate when expanded, complicate-acute, about 4–5 mm. long; disc with a small fleshy oblong-ovate sulcate callus which extends from the sinus of the lateral lobes as a free projection above the lower portion of the mid-lobe. Column slender, about 8–8.9 mm. long, slightly arcuate, extended into a short foot forming a mentum with the lateral sepals.

Two additional collections bearing the imperfect remains of the perianth at the summit of enlarged ovaries show larger leaves than the type. In *Standley 33065* the longest leaf is 18 cm. in length, while in *Standley 33058* the broadest leaf is about 4.9 cm. in width.

Ornithidium sigmoideum appears to be most closely allied to *O. Wrightii* (Schltr.) C. Schweinf., but differs strikingly in the details of the lip and in the relatively elongate column.

The specific name is in allusion to the lip.

COSTA RICA, Cerro Gallito. At 2000 meters altitude. December 20, 1927. *M. Valerio 72* (TYPE in Herb. Ames No. 33641): Province of San José, La Palma. Epiphyte on mossy tree trunk. At about 1600 meters altitude. February 3, 1924. *Paul C. Standley 33058, 33065.*

***Telipogon parvulus* C. Schweinfurth sp. nov.**

Herba nana. Caulis vaginis foliorum distichorum omnino tectus. Folia linearia vel lineari-oblonga, coriacea. Inflorescentiae axillares, laxe pauciflorae. Flores pro genere parvi. Sepala anguste ovata, breviter acuminata, concava, nervo medio conspicuo. Petala multo majora, elliptico-ovata, acuta. Labellum perlate rhombico-ovatum, latius quam longius, apice rotundato subacutum. Columna velutina, antice in callum compresso-ovatum extensa.

Plant dwarf, about 7 cm. tall (stem incomplete at base). Roots fibrous, flexuous, glabrous, numerous. Stem short, entirely concealed by the imbricating leaf-sheaths. Leaves linear or linear-oblong, coriaceous in the dried specimen, rounded at the apex with an apiculate tip; blades up to about 15 mm. long and 2 mm. wide. Inflorescences axillary. Peduncles below the raceme up to 3.2 cm. long, filiform, glabrous, with a single infundibuliform spreading sheath enclosing what appears to be an incipient branchlet. Raceme loosely 5- to 7-flowered, suberect or arcuate; rachis more or less fractiflex. Floral bracts spreading, infundibuliform. Pedicellate ovary filiform, elongate, about 11 mm. long. Flower small for the genus. Dorsal sepal very similar to the lateral sepals, but

slightly larger. Lateral sepals narrowly ovate, about 6.7 mm. long and 3 mm. wide, short-acuminate, concave, 1-nerved or very indistinctly 3-nerved, carinate near the apex with the keel extended into a short apicule. Petals much larger than the sepals, elliptic-ovate, about 10 mm. long and 7 mm. wide, acute, 9-nerved shortly above the minutely papillose base, minutely ciliolate, without reticulated veins. Lip very broadly rhombic-ovate, 14-nerved without reticulations, rounded or subacute at the apex, about 7.2 mm. long and 9.8 mm. wide near the base, minutely ciliolate, very minutely papillose at base. Column short, velutinous, extended in front into a fleshy compressed-ovate velutinous callus which is long-setose on each side at the base. Pollinia four, complanate-pyriform, in two unequal pairs.

Telipogon parvulus is remarkable for its small size throughout. It differs from *T. gracilipes* Schltr. in its much lower stature, smaller leaves and dissimilar fewer-nerved lip which is decidedly broader than long.

COSTA RICA, Cerca de "La Holanda." Fecha. September 29, 1934. *M. Valerio 971* (TYPE in Herb. Field Mus. Nat. Hist. No. 753912).

***Ornithocephalus cochleariformis* C. Schweinfurth sp. nov.**

Herba parvula, caespitosa, flabelliformis. Radices fibrosae, glabrae. Folia anguste elliptico-oblonga vel oblongo-lanceolata, equitantia, ad vaginas imbricantes articulata. Racemi arcuati vel reflexi; rhachis dense glanduloso-pubescens. Sepala flabellato-suborbicularia, extus glandulosa. Petala similia, obovata vel cuneato-obovata. Labellum simplex, ovatum, apice acuto valde involuto; discus inferne incrassatus, basi subcordatus vel truncatus. Columna rostello lineari-lanceolato decurvato ornata.

Plant small, caespitose, up to 8 cm. high to the tip

of the leaf. Roots fibrous, slender, glabrous, numerous. Leaves seven to eight, equitant, narrowly elliptic-oblong or narrowly oblong-lanceolate, up to 5 cm. long and 1 cm. wide, acute, spreading, articulated to oblong sheaths which are up to 2.4 cm. long, equitant, imbricating, and have scarious upper margins. Racemes reflexed or arcuate, up to 9 cm. long, subaxly flowered nearly to the base; rachis densely glandular-pubescent, with the internodes more or less fractiflex. Floral bracts widely spreading, broadly ovate to suborbicular, glandular-ciliate. Flowers small. Sepals thickly beset with stout glands on the outer surface and glandular-ciliate on the margin, flabellate-suborbicular, 1-nerved; the lateral sepals slightly oblique and carinate with a lacerate keel on the outer surface, about 3 mm. long and equally broad above the middle. Petals similar, broadly obovate or cuneate-obovate, about 3.3 mm. long and equally broad above the middle, finely and irregularly ciliate, 1-nerved and carinate with a lacerate keel on the outer surface. Lip simple, ovate, strongly concave above the middle with an involute tip, about 4.2 mm. long when expanded, about 3.2 mm. wide below the middle, truncate or subcordate at base, acute, 5- to 7-nerved; disc fleshy-thickened and shortly papillose across the lower half, with the thickened margins of the basal half extending onto the lamina as a keel to a point slightly above the middle on each side. Column short, with a prominent recurved linear-lanceolate rostellar process.

A collection recently acquired from Mrs. Purdom is referable to this species. It differs from the type in having the shorter leaves ranging from asymmetrically ovate to elliptic-lanceolate. One flower shows a triangular-linear stipe bearing four subglobose pollinia at its dilated summit.

Ornithocephalus cochleariformis appears to be allied to

O. tripterus Schltr., but differs markedly from that species in having smooth roots, densely glandular rachis and very dissimilar sepals and petals.

PANAMA, Province of Coclé, lower portion of valley and marshes along Rio Antón, El Valle de Antón. "Petals white, lip green." At about 500 meters altitude. February 2, 1935. *A. A. Hunter & P. H. Allen 383* (TYPE in Herb. Ames No. 42017): Valle de Antón, rim. At 2500 feet altitude. February 1936. *Mrs. M. A. Purdom s.n.*